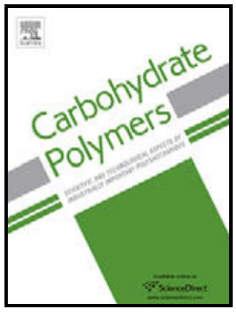

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An unexpected reactivity during periodate oxidation of chitosan and the affinity of its 2, 3-di-aldehyde toward sulfa drugs

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Highlights

- Peculiar reactivity of chitosan toward periodate oxidation in the neutral medium was studied.
- Cyclic amino iodate intermediate plays an important role on oxidation reactivity.
- DACT reactivity toward Schiff base formation is low owing to lower aldehyde content.
- Drug substitution would be more likely occur on dialdehyde groups rather than single aldehyde.

Abstract

In an attempt to determine the reactivity during the periodate oxidation of the vicinal amino sugar, chitosan was oxidized by KIO_4 in a neutral medium. The reactivity was unexpectedly found to be low. The formation of di-aldehyde chitosan (DACT) might cause the low reactivity of chitosan oxidation. Therefore, density functional theory (DFT) calculations were carried out, which revealed that the greater stability of